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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,338	10/27/2003	Leonid Isaakovich Rubinstein	TH-1786 (US)	3857

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EXAMINER	
OH, TAYLOR V	

ART UNIT	PAPER NUMBER
1625	

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,338	RUBINSTEIN ET AL.	
	Examiner	Art Unit	
	Taylor Victor Oh	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *14-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/04, 6/04, 8/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The Status of Claims

Claims 1-28 are pending.

Claims 1-13 have been rejected.

Claims 14-28 have been withdrawn from consideration.

DETAILED ACTION

1. Claims 1-13 are under consideration in this Office Action.

Priority

2. It is noted that this application claims a benefit of 60/421,752 (10/28/02).

Drawings

3. None.

Election/Restrictions

Applicant's election with traverse of Group I (claims 1-13) on 8/29/05 is acknowledged.

Claims 14-27 and 28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected groups II-III, there being no allowable generic or linking claim.

Applicants argue the following issue:

1. Group I is overlapped with Group II and Group III ; therefore, the search for Groups I, II and III would not result in a serious burden upon the examiner.

In response to applicants' argument regarding the restriction, regardless of overlapping among the Groups (I, II, III), there are three distinct, unrelated, different classes involved in the search of the unrestricted claims. The search is a burden whether or not they are so closely related to their searches. Furthermore, M.P.E.P. Section 808.02 gives legitimate reasons for the Examiner to insist on restriction such as the case of separate classification, which indicates that" each distinct subject has attained recognition in the art as a separate subject for the inventive effort, and also a separate field of search ."

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Lockemeyer et al (WO 00/15333).

Lockemeyer et al discloses the preparation of silver catalyst in which the dried carrier is used as part in the followings (page 12):

TABLE I

Carrier	A	B	C	D	E
B.E.T. Surface Area (m^2/g) [a]	0.84	0.97	0.78	0.76	0.87
Water Absorption (%)	39.7	46.2	37.6	32.5	43.4
Crush Strength (kg) [b]	6.53	8.07	12.29	10.93	5.44
Total Pore Volume (ml/g) [c]	0.408	0.460	0.390	0.430	
Median Pore Diameter (microns) [c]	1.8	2.7	1.3	4.6	
SiO_2 (%w)	0.5	0.8	0.1	0.5	0.5
Bulk Acid-Leachable Na (ppmw)	438	752	186	1907	339
Bulk Acid-Leachable K (ppmw)	95	438	109	71	37
Bulk Acid-Leachable Ca (ppmw)	207	508	526	293	123
Bulk Acid-Leachable Al (ppmw)	744	1553	657	1978	499
Bulk Acid-Leachable SiO_2 (ppmw)	808	1879	1560	> 2000	600
alpha-Alumina (% w)	Bal.	Bal.	Bal.	Bal.	Bal.

This is identical with the claims.

Claims 1- 6 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Hayden et al (EP 0357292).

Hayden et al discloses the preparation of silver catalyst along with its precursor and support (alpha-alumina particles) (page 3 , line 26) in the followings (page 5, lines 1-30):

Hollow cylinders	8 mm x 6 mm with a 2 mm hole
Pore Volume	1.12 ml/g
Surface Area (BET method)	1.06 m^2/g
Si Content	580 ppm w/v
Sol. Na Content	54 ppm w/v
Sol. K Content	10 ppm w/v

c) Preparation of Precursor

70.6g of the support was vacuum impregnated with a mixed solution from 160 ml of the silver complex solution and 91.3 ml of the lithium nitrate solution. The catalyst particles were drained and pyrolysed under nitrogen at 300° C over a period of 5 hours to decompose the silver complex essentially to the metallic state. The product was washed in boiling water for 16 hours, calcined under nitrogen to 300° C and washed a second time. The silver content was 28%, and this precursor was used for the preparation of catalysts A, B and C.

d) Preparation of Catalysts

The catalysts were prepared by impregnation of the precursor with solutions of potassium compound. From a knowledge of the pore volume, the concentration of potassium in the pores assuming them to be filled with solution as previously made up gives the "nominal potassium content after drying. Using the potassium stock solution described above, appropriate solutions were made by dilution with a mixture of 2-ethylhexanol and white spirit in a ratio of about 48:1700. Samples of precursor were then impregnated with the solutions for 16 hours in rocking vials, followed by draining and drying in air at 400° C for one hour. The catalyst preparation was then completed by calcination in air at 700° C for 14 hours. The catalysts prepared are shown in table 1.

This is identical with the claims.

Claims 1-2, 4, 6 ,and 13 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Chou et al (US 5,504,053).

Chou et al discloses the preparation of silver catalyst (see col. 29, lines 1-15) along with its carrier (table I) in the followings (see col. 14 , lines 31-63) :

TABLE I

Carrier	A	B	C	D	E	F
B.E.T. Surface Area m^2/g[a]	0.21	0.42	0.42	0.48	0.57	2.06
Water Pore Volume, cc/g	0.26	0.36	0.41	0.49	0.44	0.65
Crush Strength, FPCS, lbs[b]	100% 20 lbs	97% 15	Avg. 21 Range 15–30	90% 14	90% 15	No Data
Total Pore Volume, Hg, cc/g[c]	0.26	0.42	0.42	0.46	0.42	0.65
Average Pore Diameter, Hg, Angstroms[c]	620	560	640	550	770	1000
Median Pore Diameter, Hg, microns[c,e]	3.7	2.7	3.4	3.4	2.4	2.5
Percent Pore Volume in Pores Greater than 350 Angstroms[c]	90.0%	88.5%	89.5%	89.1%	91.5%	94.1%
Percent Pore Volume in Pores Greater than 1 Micron[c]	87.0%	82.5%	83.4%	82.3%	83.5%	61.0%
% Wt. Alpha Alumina	99.5	98	98.5	98.5	98	70–75
Water Leachable Na, ppmw	12	53	21	24	18	No Data
Acid-Leachable Na, ppmw	40	96	87	51	45	No Data
Water-Leachable K, ppmw	5	22	21	22	10	No Data
Acid-Leachable Fe, ppmw	2	5	No Data	1	5	No Data
% Wt. SiO_2	.5	2	1.5	15	2	25–30

[a]Method of Brunauer, Emmet and Teller, loc. cit.
[b]Flat Plate Crush Strength, single pellet.
[c]Determined by mercury intrusion to 55,000 psia using Micrometrics Autopore 9200 or 9210 (130° Contact angle, 0.473 N/m surface tension of Hg).
[e]Median pore diameter represents the pore diameter wherein 50% of the total pore volume is found in pores having less than (or greater than) the median pore diameter.

This is identical with the claims.

Claims 1-2, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Thorsteinson et al (EP 0425020).

Thorsteinson et al discloses the preparation of silver catalyst along with its precursor and support (alpha-alumina particles) (from page 34 , line 6 to page 35, line 30) in the followings:

Example 78

In this example, a comparison is made to show the effect of high silver content on a support having a low surface area, i.e., a surface area below that required by the present invention.

In particular, a low silver-content (15% silver by weight of finished catayist), cesium and potassium sulfate promoted catalyst having a low surface area and a low porosity carrier (Support No. U) was prepared. This catalyst is tested under oxygen conditions at two different levels of gas flow rate. The processing conditions included 30% C_2H_4, 8% O_2, 6.5%CO_2, 0.5% C_2H_6, and 10 ppm ECl). A gas hourly space velocity (GHSV) of 4000 H^{-1} was used for the first run followed by a GHSV of 8000 H^{-1} for the second run. The effect of doubling the space velocity at constant production (i.e., outlet EO) is the same as doubling the rate (i.e., turnover frequency) of the catalyst. This is tantamount to halving the silver surface area on the catalyst support.

Carrier AA is an alpha alumina carrier with properties:

Surface Area	1.17 M^2/g
Water pore volume	0.65 cc/g
Crush strength, FPCS	7.1 lbs.
Total pore volume, Hg	0.70 cc/g
Packing density	34.2 lbs/ft^3

Acid Leachable Impurities

378 ppm sodium, and 330 ppm potassium

Water Leachable Impurities

9 ppm phosphate, 4 ppm fluoride, 88 ppm aluminum, 2 ppm calcium, 60 ppm potassium, 1 ppm magnesium, 119 ppm sodium, and 157 ppm silicon.

This is identical with the claims.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayden et al (EP 0357292) in view of Pitchai et al (US 5,86,380).

Hayden et al discloses the preparation of an ethylene oxide from ethylene by using silver catalyst along with its precursor and support (alpha-alumina particles) (page 3 , line 26) in the followings (page 5, lines 1-30):

Hollow cylinders	8 mm x 6 mm with a 2 mm hole
Pore Volume	1.12 ml/g
Surface Area (BET method)	1.06 m^2/g
Si Content	580 ppm w/v
Sol. Na Content	54 ppm w/v
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c) Preparation of Precursor

70.6g of the support was vacuum impregnated with a mixed solution from 160 ml of the silver complex solution and 91.3 ml of the lithium nitrate solution. The catalyst particles were drained and pyrolysed under nitrogen at 300° C over a period of 5 hours to decompose the silver complex essentially to the metallic state. The product was washed in boiling water for 16 hours, calcined under nitrogen to 300° C and washed a second time. The silver content was 28%, and this precursor was used for the preparation of catalysts A, B and C.

d) Preparation of Catalysts

The catalysts were prepared by impregnation of the precursor with solutions of potassium compound. From a knowledge of the pore volume, the concentration of potassium in the pores assuming them to be filled with solution as previously made up gives the "nominal potassium content after drying. Using the potassium stock solution described above, appropriate solutions were made by dilution with a mixture of 2-ethylhexanol and white spirit in a ratio of about 48:1700. Samples of precursor were then impregnated with the solutions for 16 hours in rocking vials, followed by draining and drying in air at 400° C for one hour. The catalyst preparation was then completed by calcination in air at 700° C for 14 hours. The catalysts prepared are shown in table 1.

However, the instant invention differs from the prior art in that the claimed carrier comprises a silver bonded calcium carbonate with a specific weight ratio , a crush strength, a specific surface area, and a specific porosity.

Pitchai et al teaches a process of preparing vapor phase oxidation of propylene to propylene oxide (see col. 2 ,lines 21-26) by using silver and potassium salt incorporated into the carbonate support material (see col. 10-13):

The surface areas of the carbonate support materials generally range from 0.6 to about 14 m^2/g, preferably from about 1.5 to about 10 m^2/g. However, carbonate support materials having surface areas higher than 14 m^2/g are also effective for the purposes of this invention. The surface area is measured by the conventional B. E. T. method using nitrogen or krypton described by Brunauer, Emmett and Teller in *J. Am. Chem. Soc.* 60, 309–16 (1938).

The carrier materials used in the present invention may generally be described as porous or microporous and typically have water pore volumes of about 0.05 to 0.80 cc/g. (see col. 3 ,lines 32-43).

An alternative method of obtaining a carbonate-supported silver catalyst suitable for use in the process of this invention once it has been modified with potassium salt and molybdenum promoter is by co-precipitation of silver carbonate and alkaline earth metal carbonate from the respective nitrates or other water-soluble salts as described in U.S. Pat. No. 2,825,701 (incorporated herein by reference in its entirety). For example, a silver-containing carbonate support may be prepared by preparing an aqueous solution containing a silver salt such as silver nitrate and an alkaline earth metal salt such as calcium nitrate, preferably at a molar ratio from 1:1 to 1:4, dropwise adding, while stirring, an alkali metal carbonate solution such as potassium carbonate in water to form a co-precipitate of silver carbonate and alkaline earth metal carbonate. The co-precipitate may thereafter be washed, dried, impregnated with molybdenum promoter and/or potassium salt, and/or treated with a reducing agent or by calcination or the like to reduce the silver to its free metallic state. The sequence of such additional steps may be varied as desired. The co-precipitate may be coated or deposited onto a different granular, porous refractory material, as described in the aforementioned patent.

(see col. 6, lines 5-26).

However, the instant invention differs from the prior art in that the claimed salt is heptanoic acid instead of hexanoic acid.

Hayden et al expressly discloses the preparation of an ethylene oxide from ethylene by using silver catalyst along with its precursor and support (alpha-alumina particles, whereas Pitchai et al does teach the process of preparing vapor phase oxidation of propylene to propylene oxide (see col. 2 ,lines 21-26) by using silver and potassium salt incorporated into the carbonate support material (see col. 10-13).

Both prior art processes are commonly involved in the preparation of the olefin oxide in the presence of the catalyst containing silver, a carrier, an alkali metal promoter; furthermore, the relationship between the starting material of Hayden et al and that of Pitchai et al is homologous to each other. Compounds that differ only by the presence or absence of an extra methyl group or two are homologues. Homologues are of such close structural similarity that the disclosure of a compound renders *prima facie* obvious its homologue. The homologue is expected to be prepared by the same method and to have generally the same properties. This expectation is then deemed the motivation for preparing homologues. Of course, these presumptions are rebuttable by the showing of unexpected effects, but initially, the homologues are obvious even in the absence of a specific teaching to add or remove methyl groups. See *In re Wood,* 199 USPQ 137; *In re Hoke,* 195 USPQ 148; *In re Lohr,* 137 USPQ 548; *In re Magerlein,* 202 USPQ 473; *In re Wiechert,* 152 USPQ 249; *Ex parte Henkel,* 130 USPQ 474; *In re Fauque,* 121 USPQ 425; *In re Druey,* 138 USPQ 39. In all of these cases, the close structural similarity between two compounds differing by one or two methyl groups was itself sufficient show obviousness. See also MPEP 2144.09, second paragraph.

In addition, the Pitchai et al has offered guidance that carbonates are capable of providing exceptionally high propylene oxide selectivities and have been found to be surprisingly superior to other support materials (see col. 2, lines 30-35). Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the teachings of the carbonate support material into the Hayden et al process in order to produce the desired propylene oxide as an alternative to the ethylene oxide. This is because the skilled artisan in the art would expect such a modification to be successful and selective for producing the desired propylene oxide as guidance(see col. 2, lines 30-35) taught in the the Pitchai et al .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*** 11/9/05